GS-01

INSTALLATION MANUAL

6195-2201

CE
Approved

GSM-modem

www.westermo.se

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Warning!

It is of most importance that all regulations regarding use of the GSM modem is followed.

Violation against any regulation may cause withdrawn of the subscription or at major violations lead to prosecution.

Package content:

1 pcs GS-01, GSM-modem
1 pcs Antenna
1 pcs Serial cable
1 pcs Power supply cable + fuse
1 pcs User manual (this document)

Accessories: Main adapter PS-13 for 230V AC (Contact Westermo)

Content:

1.0 Functional description 4

2.0 Specifications 5

3.0 Connections 6

3.1 Terminal connections (DCE) 6
3.2 Power supply connection 6

4.0 Installation 7

4.1 SIM-Card 7
4.2 Antenna 7
4.3 Power supply 7
4.4 RS-232/V.24 connection 7
4.4.1 Voice/Audio 7
4.4.2 Boot/Reset 7

5.0 Configuration 8–49

5.1 General command 8
5.2 Call control commands 9
5.3 Network service commands 14
5.4 Security commands 15
5.5 Supplementary commands 20
5.6 Phonebook commands 22
5.6 Data commands 25
5.7 V.24/V.25 commands 28
5.8 Short message commands 35

6.0 LED function 50

7.0 Applications 50

7.1 GSM to GSM 50
7.2 GSM to GSM (V.110) 50
7.3 GSM to PSTN (TD-32) 51
7.4 GSM to ISDN (ID-90) 51
7.5 GS-01 to GS-01 (SMS) 52
7.6 GS-01, Dial up when DTR is activated 52

8.0 Trouble shooting 53

8.1 The modem does not answer through the serial link 53
8.2 The modem always return “error” when trying to issue a communication 53
8.3 The modems always return “no carrier” when trying to issue a communication 54

Functional description

The GS-01 modem provides RS-232/V.24 up to 9 600 bit/s connections over GSM networks. It can be used instead of serial cable to link PLC's, data loggers, security and surveillance system or for data acquisition.

It is possibility to have an external signal (DTR) to trigger the modem to call a pre-set number. This makes it ideal for alarm monitoring and remote diagnostics from unmanned stations.

It is also possible to send/receive SMS-messages up to 160 characters as well as fax functions. It can communicate with other GSM-modems but also traditional analogue modem such as TD-32 or ISDN-adapters like ID-90.

All configuration is made by AT-commands similar to standard analogue PSTN modems.

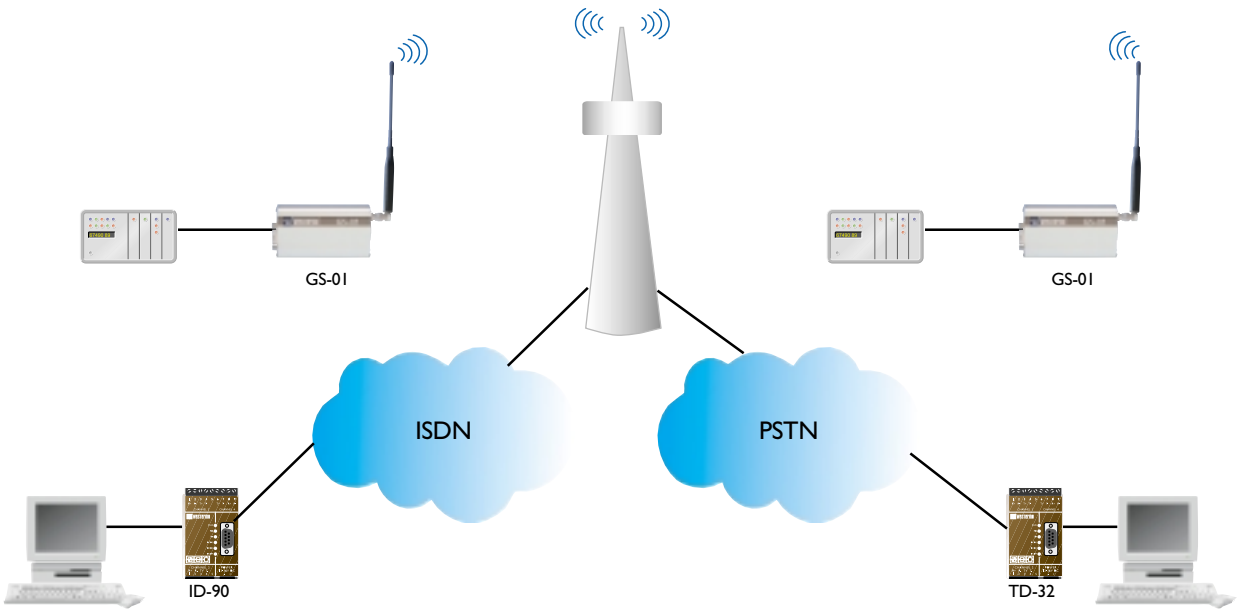
The GS-01 uses the standardised GSM network on 900 MHz. This makes it possible for world wide use (not U.S.A.).

The housing is profiled aluminium and has been designed to be easy to use and simple to install.

Note! To get the modem to work is it necessary to get a subscription (SIM-card) from some network provider. To get all functions in the GS-01 to work properly it is necessary to have the right subscription and that the network provider can support right services. It is necessary to have a subscription that can handle both receive and transmit data.

The test function of received signal strength makes it easy to see if it is possible to get a functional communication link. This can be done without any SIM-card inserted.

The GS-01 also support voice communication (some external equipment is necessary)



2.0 Specifications

Frequency	900 MHz
Radio power	2 W, Class 4
Antenna	External, 870 -960 MHz, 50 Ohms, SMA-connector
Serial interface	RS-232/V.24, 15 pin D-sub connector, female (HD)
Transmission Data	Asynchronous 2 400, 4 800, 9 600 bit/s Transparent and Non Transparent mode In Non Transparent mode only: 300, 1 200, 1200/75 Mode 3.1 KHz (PSTN) and V.110 (ISDN) AT commands according to ETSI 07.05, 07.07 and V.25ter
Data format	Up to 11 bits
Handshake	RTS/CTS or none
Transmission SMS	Mobile Originated (MO) and Mobile Terminated (MT) Mode Text & PDU point to point. Cell broadcast AT commands according to ETSI 07.05
Transmission Fax	2 400, 4 800, 7 200, 9 600 bit/s Class 1, Group 3 compatible, Tele service 62
SIM-card	Small SIM-card
Power supply	5–32V DC Option: PS-13 main adapter for 230V AC
Power consumption	Idle: 20 mA, active: 200mA
Fuse	2.5AT mounted on the power supply cable
Temperature range	Operating: –20°C to +55°C Storage: –25°C to +70°C
Humidity	0-95% RH, non-condensing
Dimensions, mm	110 x 54 x 25
Weight	<140 gram

Approvals

TAC 330142-FAC33, 14th January 1999

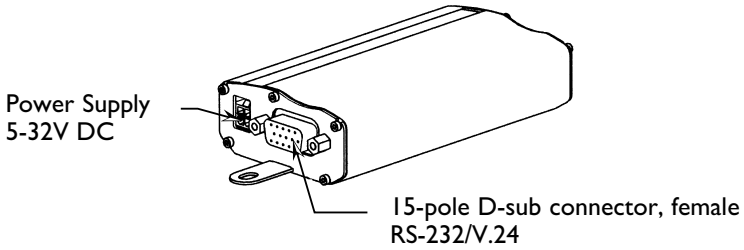
CTR19 access GSM Phase 2

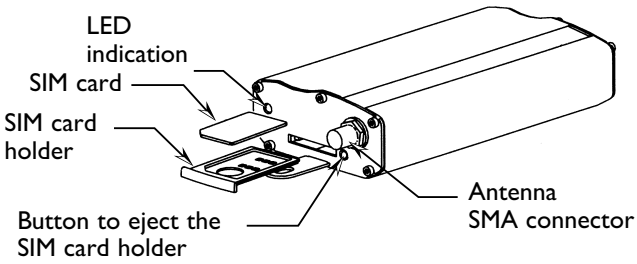
CTR20 Telephone GSM Phase 2

CE approvals according to 98-790

EMC: 89-336 CEE

3.0 Connections





3.1 Terminal connections (DCE)

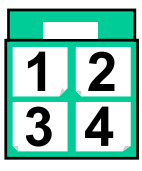
RS-232/V.24, 15-pin D-sub, female, High density

Direction	Connection no.	CCITT	Description
O	1	109	DCD/Data Carrier Detect
O	6	104	RD/Receive Data
I	2	103	TD/Transmit Data
I	8	108.2	DTR/Data Terminal Ready
–	9		SG/Signal Ground
O	7	107	DSR/Data Set Ready
I	12	105	RTS/Request to Send
O	11	106	CTS/Clear to Send
O	13	125	RI/Ring Indicator
Audio	4		Microphone (+)
	5		Microphone (–)
	10		Speaker (+)
	15		Speaker (–)
Boot	3		Boot
Reset	14		Reset

I = Input on GS-01 **O** = Output on GS-01

3.2 Power supply connection

Connector	Connection no.	Supply
4-position	1	+ 5 – 32V DC
Micro-Fit 3.0	2	0V
	3–4	Not in use



4.0 Installation

4.1 SIM-card

To get the modem to work is it necessary to have a GSM subscription from a network provider.

They will provide you with a SIM card that should be mounted in the SIM card holder. Use a sharp element and press the yellow button to eject the holder. Mount the SIM card in the holder and make sure it is correctly installed before it is pushed back into the modem.

4.2 Antenna

Remove the protection from the SMA connector and connect the enclosed antenna.

If any other type of antenna is required it should be within the frequency 870–960 MHz, 50 Ohms.

4.3 Power supply

Use enclosed power supply cable to modem and DC power source, Red (+5–32V DC), black (GND).

Westermo can supply a main adapter for 230V AC (Contact Westermo).

4.4 RS-232/V.24 connection

To be able to configure the modem connect the unit to a serial interface on a terminal or PC with the enclosed serial cable. The configuration is made by using AT-commands.

It is only the RS-232/V.24 signal that is connected in enclosed cable.

4.4.1 Voice/Audio

To be able to use Voice/audio facility another serial cable has to be used (Contact Westermo).

4.4.2 Boot/Reset

To be able to use Boot/Reset facility another serial cable has to be used (Contact Westermo).

5.0 Configuration

Note! To be able to configure the modem all the AT-commands has to be written with capital letters, e.g. AT+CPIN.

In this manual we have only described the most frequently used commands. For the complete AT-commands manual, please, visit our web, www.westermo.se where you can find it in PDF-format.

General commands

+CGMM – Request model identification

This command is used to get the supported bands (GSM 900, DCS 1800 or PCS 1900). The answer could be a combination of different bands in the case of multiband modules.

Application to GSM	AT+CGMM	get hardware version
GSM to application	900P OK	GSM 900 MHZ primary band, or “900E” (extended band), “1800” (DCS), “1900” (PCS) or “MULTIBAND”

+GCAP – Capabilities list

This command gives the complete capabilities list.

Application to GSM	AT+GCAP	get capabilities list
GSM to application	+GCAP: +CGSM +FCLASS	supports GSM commands and FAX

A/ – Repeat last command

Only A/ command can not be repeated.
This command repeats the last command executed.

Application to GSM	A/	repeat last command

Call control commands

D – Dial command

Command syntax: ATD <Numb> [I / i] [G/g] [;]
ATD> <PhbStr> [I / i] [G/g] [;]
ATD> mem <n> [I / i] [G/g] [;]
ATD> <PhbIndex> [I / i] [G/g] [;]

The ATD command is used to **establish a speech, data or fax call**.

For a data or fax call, the application sends to the GSM module the following ASCII string: (the bearer has to be selected before with the +CBST command)

ATD<nb> where <nb> is the called phone number.

For a voice call, the application sends to the GSM module the following ASCII string: (the bearer has to be selected before, if not a default bearer is used)

ATD<nb>; where <nb> is the called phone number.

Please, notice that in case of **international number**, the local international prefix has not to be set (usually 00) but need to be replaced by the ”+” character.
Example: to establish a voice call to Wavecom from another country,
the AT command shall be:

ATD+33146290800;

Notice that some countries can have particular numbering rules for their GSM handset numbering.

The answer to the ATD command can be one of the following ones:

Verbose result code	Numeric (V0 set)	Description
OK	0	if the calls succeeds, for voice call only
CONNECT <speed>	10,11,12,13,14,15	if the calls succeeds, for data calls only, <speed> takes the value negotiated by the GSM module
BUSY	7	if the called party is already in communication
NO ANSWER	8	if no hang up is detected after a fixed network time-out
NO CARRIER	3	Call setup failed or remote user release. Use the AT+CEER command to know the failure cause

Direct dialling from a phonebook location (stored in SIM card) can be done with the following command:

ATD> <index>; for calling <index> from the selected phonebook (by +CPBS command)

ATD>"BILL"; for calling "BILL" from the selected phonebook

ATD> mem <index> (mem is **"SM"**, **"FD"** or **"ON"**, see +CPBS command) is a way to directly dial from a phonebook number.

Application to GSM	AT+CPBS?	Which phonebook is selected?
GSM to application	+CPBS:"FD", 5,10	FDN phonebook is selected 5 locations are used and 10 locations are available.
Application to GSM	ATD>SM6;	Call index 6 from ADN phonebook

When **FDN phonebook** has been **locked** only the numbers beginning with the digits of FDN phonebook entries can be called.

For example, if "014629" is written in the FDN phonebook all the phone numbers beginning with these 6 digits can be called.

It is allowed to override the **CLIR supplementary service** subscription for **this call only**.

"**I**" means "**invocation**" (restrict CLI presentation)

"**i**" means "suppression" (allow CLI presentation).

It is allowed to control the **CUG supplementary service** information by "G" or "**g**" for **this call only**. The index and info values set with command +CCUG are used. An outgoing call attempt could be refused if the AOC service is active and the credit is expired (NO CARRIER).

When trying to make an outgoing call while there is an active call, the active call is first **put on hold**, then the call setup is made.

H – Hang-Up command

The command ATH (or ATH0) is used by the application to disconnect the remote user. In case of multiple calls, all calls are released (active, held and waiting calls).
The specific Wavecom command ATH1 has been appended to disconnect only the outgoing call. It can be useful in case of multi communication.

Application to GSM	ATH	ask for disconnection
GSM to application	OK	all calls, if any, are released
Application to GSM	ATH1	ask for outgoing call disconnection
GSM to application	OK	outgoing call, if any, is released

A – Answer a call

When the GSM module receives a call, it set the **RingInd** signal and sends to the application the ASCII string "**RING**" or "+**CRING**: **<type>**" if cellular result code (+CRC) is enabled. Then it waits for the application to accept the call.

GSM to application	RING	incoming call
Application to GSM	ATA	answer to this incoming call
GSM to application	OK	call accepted
Application to GSM	ATH	disconnect call
GSM to application	NO CARRIER	call disconnected

ATDL – Redial last number

This command is used by the application to redial the last number used in the ATD command. The last dialled number is displayed followed by ";" for speech calls only.

Application to GSM	ATDL	redial last number
GSM to application	0146290800;	last call was a speech call
	OK	command valid

AT%Dn – Automatic dialling with DTR

This command allows to activate and deactivate automatic dialling of the phone number stored in the first location of ADN phonebook. The number is dialled on DTR OFF to ON transition.

Sets commands:	**AT%D<n>[;]**	
Options:	n (0–1)	for activate or deactivate the automatic dialling.
;		Informs the module that the number is a voice rather than a fax or data number.
AT%D0		Deactivates automatic DTR dialling.
AT%D1;		Activates automatic DTR dialling if DTR switches from OFF to ON; Dials the phone number in the first location of ADN phonebook. **Speech call**
AT%D1		Activates automatic DTR dialling if DTR switches from OFF to ON; Dials the phone number in the first location of ADN phonebook. **Data or Fax call.**

Example:

Application to GSM	AT%D1;	Activates DTR dialling.
GSM to application	OK	Command has been executed.
	DTR is OFF	
	DTR switches ON	The number in the first location of the ADN phonebook is dialled automatically.
	DTR switches OFF	The module goes on-hook.

ATS0 – Automatic answer

This S0-parameter controls the automatic answering feature of the mobile.

Application to GSM	ATS0=2	Automatic answer after 2 rings
GSM to application	OK	
Application to GSM	ATS0?	Current value
GSM to application	002 OK	Always 3 characters with leading zeros
Application to GSM	ATS0=0	No automatic answer
GSM to application	OK	Command valid

All others S-parameters (S6,S7,S8 ...) are not implemented.

+CICB – Incoming Call Bearer

Command syntax: AT+CICB= <mode>

This specific command is used for incoming call type when no incoming bearer is given (single numbering scheme, see +CSNS).

<mode> values:

0: Data
1: Fax
2: Speech

Application to GSM	AT+CICB=1	If no incoming bearer, force a fax call
GSM to Application	OK	Command accepted
Application to GSM	AT+CICB=2	If no incoming bearer, force a speech call
GSM to Application	OK	Command accepted
Application to GSM	AT+CICB?	Interrogate value
GSM to Application	+CICB: 2	Default incoming bearer: speech call
Application to GSM	AT+CICB=?	Test command
GSM to Application	+CICB: (0-2)	Speech, data or fax default incoming bearer

+CSQ – Signal Quality

This command shall be used to know the received signal strength indication (<rssi>) and the channel bit error rate (<ber>) with or without any SIM card inserted.

<rssi>:

0: –113 dBm or less
1: –111 dBm
2...30: –109 to –53 dBm
31: –51dBm or greater
99: not known or not detectable

<ber>:

0...7: as RXQUAL values in the table GSM 05.08
99: not known or not detectable

Application to GSM	AT+CSQ	
GSM to application	+CSQ: <rssi>,<ber> OK	<rssi> and <ber> as defined before

+CREG – Network registration

This command is used by the application to know the registration status of the mobile.

Command syntax:	AT+CREG= **<mode>**
Response syntax:	+CREG: **<mode>, <stat> [,<lac>,<ci>]** for AT+CREG? command only

<mode>

0: Disable network registration unsolicited result code (default)
1: Enable network registration code result code +CREG: <stat>
2: Enable network registration and location information unsolicited result code +CREG: <stat>,<lac>,<ci> if there is a change of the network cell.

<stat>

0: not registered, ME is not currently searching a new operator
1: registered, home network
2: not registered, ME currently searching a new operator to register to
3: registration denied
4: unknown
5: registered, roaming

<lac>: string type; two byte location area code in hexadecimal format (e.g. ”00C3” equals 193 in decimal)

<ci>: string type; two byte cell ID in hexadecimal format

Application to GSM	AT+CREG?	
GSM to application	+CREG: <mode>,<stat> OK	as defined before

Application to GSM	AT+CREG=<mode>	Disable/enable network registration Unsolicited result code
GSM to application	OK	Command valid
Application to GSM	AT+CREG=?	
GSM to application	+CREG: (0–2)	0,1,2 <mode> values are supported

Security commands

+CPIN – Enter PIN

This command is used to enter ME passwords (CHV1 / CHV2 / PUK1 /PUK2…) which are needed before any other functionality of the ME can be used. The CHV1/CHV2 length is between 4 and 8 digits, the PUK1/PUK2 length is 8 digits only.

If the user application try to establish an outgoing call before having validated the SIM PIN code (CHV1), then the GSM module will refuse the ”ATD” command with a ”+CME ERROR: 11” (SIM PIN required).

It’s up to the application to validate the PIN after each reset or power on if the PIN was enabled.
The application shall therefore use the command:

AT+CPIN=<pin>

Application to GSM	AT+CPIN=1234	Enter PIN
GSM to application	OK	PIN code is correct
Application to GSM	AT+CPIN=5678	enter PIN
GSM to application	+CME ERROR: 3	Operation not allowed, PIN previously entered

After 3 unsuccessful codes, the PUK will then be required. The PUK validation forces the user to enter as a second parameter a new PIN code which will be the new PIN code if the PUK validation succeeds. The CHV1 is then **enabled** if the PUK1 is correct.
The application shall therefore use the command:

AT+CPIN=<Puk>,<NewPin>

Application to GSM	AT+CPIN=00000000,1234	Enter PUK and new PIN
GSM to application	+CME ERROR: 16	Incorrect PUK
Application to GSM	AT+CPIN=12345678,1234	Enter PUK and new PIN, 2nd attempt
GSM to application	OK	PUK correct, new PIN stored

To know which code has to be entered (or not), the following interrogation command can be used:

AT+CPIN?

The possible responses are:

+CPIN: READY	ME is not pending for any password
+CPIN: SIM PIN	CHV1 is required
+CPIN: SIM PUK	PUK1 is required
+CPIN: SIM PIN2	CHV2 is required
+CPIN: SIM PUK2	PUK2 is required
+CPIN: PH-SIM PIN	SIM lock (phone-to-SIM) is required
+CPIN: PH-NET PIN	Network personnalisation is required
+CME ERROR: <err>	SIM failure (13) absent (10) etc...

Please note that in this case the mobile does not finish its response with the OK string. The response +CME ERROR: 13 (SIM failure) is returned after 10 unsuccessful PUK presentations. The SIM card is then out of order and shall be replaced by a new one.

Example: 3 failed PIN validations + 1 successful PUK validation

AT+CPIN?	Read the PIN status
+CPIN: SIM PIN	The GSM module requires SIM PIN
AT+CPIN=1235	First attempt to enter a SIM PIN
+CME ERROR: 16	Bad PIN
AT+CPIN=1236	Second attempt
+CME ERROR: 16	Bad PIN
AT+CPIN=1237	Third attempt
+CME ERROR: 16	Bad PIN
AT+CPIN?	Read PIN state
+CPIN: SIM PUK	The GSM module requires PUK
AT+CPIN=99999999,5678	The PUK is entered, the new PIN shall be
OK	5678 PUK validation is OK. New Pin is 5678
AT+CPIN?	Read PIN state
+CPIN: READY	GSM module is ready

If the user try to do something which requires PIN2 (CHV2) the GSM module will refuse his action with a ”+CME ERROR: 17” (SIM PIN2 required).
Then the GSM module is waiting SIM PIN2 to be given.

Of course if SIM PIN2 is blocked, SIM PUK2 is required instead of SIM PIN2.

For instance, the GSM module needs PIN2 to write in the fixed dialling phonebook (FDN), so if SIM PIN2 authentification has not been done during the current cession the SIM PIN2 is required:

Application to GSM	AT+CPBS=”FD”	Choose FDN
GSM to application	OK	
Application to GSM	AT+CPBW=5,”01290917”,129,”Jacky”	Write in FDN at location 5
GSM to application	+CME ERROR:17	SIM PIN2 is required
Application to GSM	AT+CPIN?	
GSM to application	SIM PIN2	SIM PIN2 is required
Application to GSM	AT+CPIN=5678	Enter SIM PIN2
GSM to application	OK	
Application to GSM	AT+CPBW=5,”01290917”,129,”Jacky”	Write in FDN at location 5
GSM to application	OK	Now writing in FDN is allowed

Please note that the GSM module ask only once PIN2 or PUK2, so if they aren’t entered right, the next +CPIN? command will return ”+CPIN: READY”.

Remark

In the way Application to GSM, an ”h” character shall be added before the PIN value if cyphering mode (with D.E.S algorithm) is on. See +EXPKEY command.

Same remark for +CLCK and +CPWD commands.

+CLCK – Facility lock

This command shall be used by the application to lock, unlock or interrogate a ME or network facility <fac>.

Command syntax: AT+CLCK= <fac>,<mode>[,<passwd>[,<class>]]

Response syntax: +CLCK: <status> [,<class1>]
<CR><LF>+CLCK: <status>,<class2>
[…]]

Command	**Possible responses**
AT+CLCK=”SC”,1,1234 *Note: Enable PIN*	OK *Note: PIN was right*
AT+CLCK? *Note: Read PIN status*	+CLCK: (”PS”, 0), (”PN,0),(”FD”,0) OK *Note: PIN is enables, no SIM lock, no network lock, no informati_n on Call barring* *(**no longer supported** in GSM 07.07)*
AT+CLCK=”SC”,0,5555 *Note: Disable PIN*	+CME ERROR: 16 *Note: PIN was wrong*
AT+CPIN=1234 *Note: Enter PIN*	OK *Note: PIN was good*
AT+CLCK=? *Note: Request supported facilities*	+CLCK:(”PS”,”SC”,”AO”,”OI”,”OX”,”AI”,”IR”,”AB”, OK *Note: Supported facilities*
AT+CLCK=”PN”,1,12345678 *Note: Activate network lock*	OK Network lock activated
AR+CLCK=”AO”,1,1234,2 *Note: Activate all outgoing calls barring for data calls*	OK *Note: Call barring is activate*
AT+CLCK=”AO”,2 *Note: Query BAOC status*	<CR><LF> +CLCK: 1,2 OK *Note: BAOC activate for data calls only*

Defined values

The following <fac> values are supported:

”PS”: SIM lock facility with a 8 digits password.

”SC”: PIN enable (<mode> = 1) / disable (<mode> = 0)

”AO”: BAOC (Barr All Outgoing Calls)

”OI”: BOIC (Barr Outgoing International Calls)

”OX”: BOIC-exHC (Barr Outg. Internat Calls except to Home Country)

”AI”: BAIC (Barr All Incoming Calls)

”IR”: BIC-Roam (Barr Inc. when Roaming outside Home Country)

”AB”: All Barring services

”AG”: All outGoing barring services

”AC”: All inComing barring services

”PN”: Network lock with a 8 digits password (NCK).

”FD”: SIM Fixed Dialling Numbers (FDN) memory feature
(PIN2 is required as <password>)

<mode> 0: unlock the facility
1: lock the facility
2: query status

<class>: A facility status can be changed for only one class, or for all classes (7 or omitted).
<class> 1: Voice (telephony)
2: Data (refer to all bearer services)
4: Fax (facsimile services)
8: Short Message service
7: equal to all classes (Default value)

Any attempt to combine different classes will result in activation/desactivation/ interrogation of all classes.
The password maximum length is given with the AT+CPWD=? command.

Supplementary Services commands

+CLCK – Call barring

This command allows control of the call barring supplementary service.

Locking, unlocking or querying the status of a call barring is possible for all or a specific class.

Command Syntax:

AT+CLCK= <fac>, <mode> [, <password> [, <class>]]

Response Syntax: (for <mode>=2 and command successful)

+CLCK: <status> [, <class1> [<CR><LF>+CLCK: <status>, <class2>, [...]]

* <fac>:

”AO”, ”OI”, ”OX”	for outgoing calls barring
”AI”, ”IR”	for incoming calls barring
”AG”, ”AC”, ”AB”	for all calls barring (<mode>=0 only)

* <mode>

0	unlocks the facility
1	locks the facility
2	query status

* <class>:see description for +CLCK command (Call Barring)

The combination of different classes in not supported, it will only result in the activation / deactivation / status request of all classes (7).

Password code must be on 4 digits maximum.

Application to GSM	AT+CLCK=”AO”,1,1234	
GSM to application	OK	Command valid
Application to GSM	AT+CLCK=”AO”,0,5555	
GSM to application	+CME ERROR: 16	Wrong password
Application to GSM	AT+CLCK=”AO”,0,1234	
GSM to application	OK	Command valid

+CPWD – Modify SS password

This command shall be used by the application to change the supplementary service password. The command to manage this functionality is:

Command Syntax:

AT+CPWD=<fac>,<OldPassword>, <NewPassword>

for <fac> see +CLCK command with only ”P2” facility added (SIM PIN2).

Application to GSM	AT+CPWD=”AO”,1234,5555	Change Call Barring password

GSM to application	OK	Password changed
Application to GSM	AT+CPWD=”AO”,1234,5555	Change password
GSM to application	+CME ERROR: 16	Wrong password
Application to GSM	AT+CPWD=”AO”,5555,1234	Change password
GSM to application	OK	Password changed

Whatever the facility, the change of password is performed for all calls barring.

+CLIP – Calling line identification presentation

This command allows control of the calling line identification presentation supplementary service. When the presentation of the CLI (Calling Line Identification) is enabled (and calling subscriber allows), +CLIP response is returned after every RING (or +CRING) result code.

Command syntax:

AT+CLIP=<n>

Response syntax:

+CLIP: <n>,<m> for AT+CLIP?

+CLIP: <number>, <type>[,<subaddr>, <satype>, <alpha>]

for an incoming call, after each RING or +CRING indication

<n>: parameter sets/shows the result code presentation in the TA

0	Disable
1	Enable

<m>: parameter shows the subscriber CLIP service status in the network

0	CLIP not provisioned
1	CLIP provisioned
2	Unknown (no network...)

Application to GSM	AT+CLIP=1	Enable CLIP
GSM to application	OK	CLIP is enabled
Application to GSM	AT+CLIP?	Ask for current functionality
GSM to application	+CLIP: <n>,<m> OK	<n> and <m> defined as above
GSM to application	RING	Incoming call
“070888888”129,1,,,	+CLIP: name presentation “FRED”	Incoming call with number and
Application to GSM	AT+CLIP=0	Disable CLIP presentation
GSM to application	OK	Command valid

+CPBS – Select phonebook memory storage

This command selects phonebook memory storage. The available phonebooks are the ADN (SIM), FDN (SIM fixdialling, restricted phonebook), and MSISDN (SIM own numbers) phonebooks.

Application to GSM	AT+CPBS= ”SM”	Select ADN phonebook
GSM to application	OK	ADN phonebook is selected
Application to GSM	AT+CPBS=?	Possible values
GSM to application	+CPBS: (”SM”,”FD”,”ON”)	ADN, FDN, MSISDN
OK		Phonebooks supported
Application to GSM	AT+CPBS?	Status
GSM to application	+CPBS: ”SM”,10,20	ADN phonebook selected,
	OK	10 used locations, 20 locations available

The ADN phonebook could not be selected is FDN is active.

+CPBR – Read phonebook entries

This command returns phonebook entries for a location range from the current phonebook memory storage selected with +CPBS.

Application to GSM	AT+CPBR=?	Test command
GSM to application	+CPBR: (1-50), 20,10 OK	50 locations (from 1 to 50), max length of 20 for phone 10 characters max for the associated text
Application to GSM	AT+CPBR=12,14	Read entries from 12 to 14
GSM to application	+CPBR: 12,”112”,129, ”Emergency” +CPBR: 13, ”+331290909”,145, ”Fred” +CPBR: 14, ”0146290808”, 129, ”Zazi” OK	Display locations 12,13,14 with Location, Number, Type (TON/NPI), Text
Application to GSM	AT+CPBR=10	Read entry 10
GSM to application	+CPBR:10,”0146290921”, 129,”Rob” OK	Display location 10
Application to GSM	AT+CPBR=52	Read entry 52 (wrong)
GSM to application	+CME ERROR: 21	Invalid index

+CPBF – Find phonebook entries

This command returns phonebook entries which alphanumeric field start with a given string. The AT+CPBF= ”” command can be used to display all phonebook entries sorted in alphabetical order.

Application to GSM	AT+CPBF=?	Test command
GSM to application	+CPBF: 20,10 OK	Max length of 20 for phone 10 characters for the text
Application to GSM	AT+CPBF= ”E”	Read entries with ”E”
GSM to application	+CPBF: 12,”112”,129, ”Emergency” +CPBF: 15,”+331290101”, 145, ”Eric” OK	Display locations with text field starting with ”E”
Application to GSM	AT+CPBF=”H”	Read entries with ”H”
GSM to application	+CME ERROR: 22	Entry not found

+CPBW – Write phonebook entry

This command writes phonebook entry in location number <index> in the current phonebook memory storage.

Application to GSM	AT+CPBW=?	Test command
GSM to application	+CPBW: (1-50),20, (129,145),10 OK	50 locations, phone length=20, TON/NPI of 129 or 145, text length=10
Application to GSM	AT+CPBW=3	Erase location 3
GSM to application	OK	Location 3 erased
Application to GSM	AT+CPBW=5, ”112”,129 ,”SOS”	Write at location 5
GSM to application	OK	Location 5 written
Application to GSM	AT+CPBW=5,”01290917”, 129,”Jacky”	Overwrite location 5
GSM to application	OK	Location 5 is overwritten
Application to GSM	AT+CPBW=, ”+33145221100”,145, ”SOS”	Write at the first free location
GSM to application	OK	Free location is written

Application to GSM	AT+CPBW=,”0345221100”, 129,”SOS”	Write at the first free location
GSM to application	+CME ERROR: 20	Phonebook full
Application to GSM	AT+CPBW=57,”112”, 129 ,”WM”	Write at loc 57 (wrong)
GSM to application	+CME ERROR: 21	Invalid index
Application to GSM	AT+CPBW=7, ”012345678901234567 890”,129 ,”WAVE”	Write at loc. 7 a long Phone number (21 digits)
GSM to application	+CME ERROR: 26	Phone too long
Application to GSM	AT+CPBW=7, ”0122334455”,129 , ”WAVECOM TEL”	Write at loc. 7 a long Text (11 characters)
GSM to application	+CME ERROR: 24	Text too long

When the fixed dialling phonebook (FDN) is locked , this command is not allowed.
Moreover, **when FDN is unlocked, PIN2 is required to write** in the FDN phonebook.
But if PIN2 authentification has been done during the current cession ,
+CPBW command with FDN is allowed .

Application to GSM	AT+CPBS=”FD”	Choose FDN
GSM to application	OK	
Application to GSM	AT+CPBW=5,”01290917”, 129,”Jacky”	Write in FDN at location 5
GSM to application	+CME ERROR:17	SIM PIN2 is required
Application to GSM	AT+CPIN?	
GSM to application	SIM PIN2	SIM PIN2 is required
Application to GSM	AT+CPIN=5678	Enter SIM PIN2
GSM to application	OK	
Application to GSM	AT+CPBW=5,”01290917”, 129,”Jacky”	Write in FDN at location 5
GSM to application	OK	Now writing in FDN is allowed

+CBST – Bearer type selection

Command syntax: AT+CBST= **<speed>, <name>, <ce>**

No data compression is provided and only asynchronous modem is supported (<name> = 0).

<speed>	Description	Modem type
0 (default)	Autobauding	None
1	300 bit/s	V.21
2	1 200 bit/s	V.22
3	1 200/75 bit/s	V.23
4	2 400 bit/s	V.22bis
5	2 400 bit/s	V.26ter
6	4 800 bit/s	V.32
7	9 600 bit/s	V.32
8	Specific	
65	300 bit/s	V.110
66	1 200 bit/s	V.110
68	2 400 bit/s	V.110
70	4 800 bit/s	V.110
71	9 600 bit/s	V.110
<ce>	**Connection element**	
0	Transparent only	
1(default)	Non transparent only	
2	Transparent preferred	
3	Non transparent preferred	
Application to GSM	AT+CBST=7,0,1	Ask for a bearer
GSM to application	OK	Bearer supported
Application to GSM	AT+CBST=81,0,0	Ask for a bearer
GSM to application	+CME ERROR: 4	Bearer not supported

This command applies to both outgoing and incoming data calls but in a different way. For outgoing call the two parameters (e.g. <speed> and <ce>) apply, whereas for incoming call only the <ce> parameter applies.

Note 1) as far as incoming calls are concerned, if <ce> is set to T only and the network proposes NT only or vice versa then the call is released.

Note 2) older values 100 and 101 for <ce> are retained for compatibility purpose but shall not be used anymore, values 2 and 3 shall be used instead.

+FCLASS – Select mode

This command puts the module into a particular mode of operation (data or fax).

Command syntax: AT+FCLASS= **<n>**

<n>	**Description**
0	Data
1	Fax class 1

Application to GSM	AT+FCLASS=?	Test command
GSM to application	+FCLASS: (0,1) OK	Done
Application to GSM	AT+FCLASS=0	Data mode asked
GSM to application	OK	Command valid
Application to GSM	AT+FCLASS=1	Fax class 1 mode asked
GSM to application	OK	Command valid
Application to GSM	AT+FCLASS?	Current value
GSM to application	+FCLASS: 1 OK	Command valid

+CR – Service reporting control

This command enables a more detailed service reporting, in case of data incoming or outgoing call. Before sending the CONNECT response to the application, the GSM module will precise the type of data connection that have been established.

These report types are:

+CR: ASYNC	For asynchronous transparent
+CR: REL ASYNC	For asynchronous non-transparent

Application to GSM	AT+CR=0	Extended reports disabled
GSM to application	OK	Command valid
Application to GSM	AT+CR=1	Extended reports enabled
GSM to application	OK	Command valid

+CRC – Cellular result codes

This command enables a more detailed ring indication, in case of incoming call (voice or data). Instead of the string ”RING”, an extended string is used to indicate which type of call is ringing (e.g. +CRING: VOICE).

These extended indications are:

+CRING: ASYNC	for asynchronous transparent
+CRING: REL ASYNC	for asynchronous non-transparent
+CRING: VOICE	for normal speech.
+CRING: FAX	for fax calls

Application to GSM	AT+CRC=0	Extended reports disabled
GSM to application	OK	Command valid
Application to GSM	AT+CRC=1	Extended reports enabled
GSM to application	OK	Command valid

+DOPT – Other radio link parameters

This Wavecom specific command allows to change some supplementary radio link protocol parameters.

Command syntax:	AT+DOPT=**<reset_allowed>**,<dtx_allowed>
<reset_allowed>	**Description**
0	Data communication is hung up in case of bad radio link.
1 (default)	Data communication goes on in case of bad radio link (possible loose of data)

The second parameter is reserved for future use.

Application to GSM	AT+DOPT=?	Test command
GSM to application	(0,1),(0,1) OK	
Application to GSM	AT+DOPT=1	Set new parameters
GSM to application	OK	Command valid
Application to GSM	AT+DOPT?	Current values
GSM to application	1,1 OK	Command valid

+IPR – Fixed DTE rate

This commands specifies the data rate at which the DCE will accept commands.

Application to GSM	AT+IPR?	
GSM to application	+IPR: 9 600 OK	current rate is 9 600 bit/s
Application to GSM	AT+IPR=?	
GSM to application	+IPR:(0, 2 400, 4 800, 9 600, 19 200) , possible values (1) (300, 600, 1 200, 38 400, 57 600, 115 200) OK	
Application to GSM	AT+IPR=38 400	
GSM to application	OK	disable autobauding and set rate to 38 400 bit/s
Application to GSM	AT+IPR=0	
GSM to application	OK	enable autobauding

Note (1): first set of values indicates the range of auto detectable speeds. The second set of values indicates all the possible speeds which can be used by DCE.

An autobauding is provided which operates from 2 400 to 19 200 baud.
However some constraints have to be dealt with:

Any AT command issued by DTE must start with a capital ‘A’ and ‘T’ (or ‘\’). If not, DCE may send back some garbagge characters and get de-synchronized. Should it happen, DTE shall just issue once or twice ‘AT\r’ (at 2 400 or 4 800 baud) or just ‘AT’ (at 9 600 baud) to get the modem re-synchronized.

The DTE shall wait for 1ms after receipt of the last character of the AT response (which is always ‘\n’ or 0x0A) to send a new AT command at either the same rate or a new rate. Shoud this delay ignored, DCE can get de-synchronised. Once again, sending once or twice ‘AT\r’ or just ‘AT’ causes the DCE to recover.

Be careful: at start-up if autobauding is enabled and no AT command has been received yet, the module sends all unsolicited responses (like RING) at 9 600 baud.

+ICF – DTE-DCE character framing

This command is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use.

Command syntax: AT+ICF= **<format>, <parity>**

*** <format>:**

0	Autodetect	Not supported
1	8 Data 2	Stop supported
2	8 Data 1	Parity 1 Stop supported
3	8 Data 1	Stop supported
4	7 Data 2	Stop supported
5	7 Data 1	Parity 1 Stop supported
6	7 Data 1	Stop supported

*** <parity>:**

0	Odd	Supported
1	Even	Supported
2	Mark	Supported
3	Space	Supported
4	None	Supported

Note 1) Setting a character framing different from 8N1 will disable autobauding (in the case it was activated). However setting it back to 8N1 will not re-enable autobaud.

Note 2) Setting the framing to 8N1 will let the autobauding enabled, if it was already enabled (implying framing was already 8N1).

+IFC – DTE-DCE local flow control

This command is used to control the operation of local flow control between the DTE and DCE.

AT+IFC=**<DCE_by_DTE>,<DTE_by_DCE>**

*** < DCE_by_DTE >:**

0	none	Supported
1	Xon/Xoff local circuit 103	Not supported
2	RTS	Supported
3	Xon/Xoff global on circuit 103	Not supported

Important note: When this parameter is set to 2 (DTE invokes flow control through RTS) the behavior of the DCE is the following:
If the DCE has never detected RTS in high (or ON) condition since startup then it ignores RTS, assuming this signal is not connected.
As soon as DCE detects RTS high, then this signal acts upon it.
Therefore subsequent RTS transition to OFF will prevent DCE from sending any further data in online and in offline as well.
This behavior allows the user to use the default settings (hardware flow control) and let RTS disconnected. In the case RTS is connected and is high at least once then it acts upon DCE.

< DTE_by_DCE >:

0	none	Supported
1	Xon/Xoff circuit 104	Not supported
2	CTS	Supported

When this parameter is set to 0 (none) then CTS is kept high all the time.

Application to GSM	AT+IFC?	
GSM to application	+IFC: 2,2 OK	Current values
Application to GSM	AT+IFC=?	
GSM to application	+IFC: (0,2),(0,2) OK	Possible values
Application to GSM	AT+IFC=0,0	
GSM to application	OK	New values

&C – Set DCD signal

This commands controls the Data Carrier Detect (DCD) signal.

Application to GSM	AT&C0	DCD always on
GSM to application	OK	Command valid
Application to GSM	AT&C1	DCD matches state of the remote modem's data carrier
GSM to application	OK	Command valid

&D – Set DTR signal

This commands controls the Data Terminal Ready (DTR) signal.

Application to GSM	AT&D0 the	DTR signal is ignored
GSM to application	OK	Command valid
Application to GSM	AT&D1	Modem switches from data to command mode when DTR switches from ON to OFF
GSM to application	OK	Command valid
Application to GSM	AT&D2	Upon DTR switch from ON to OFF, the call is clear down
GSM to application	OK	Command valid

&S – Set DSR signal

This commands controls the Data Set Ready (DSR) signal.

Application to GSM	AT&S0 DSR	Always on
GSM to application	OK	Command valid
Application to GSM	AT&S1	DSR off in command mode, DSR on in data mode
GSM to application	OK	Command valid

O – Back to online mode

If you have established a connection and the mobile is in online command mode, this command allows to return to online data mode.

Application to GSM	ATO	
GSM to application	OK	Command valid

Q – Result code suppression

Determines whether the mobile sends result codes or not.

Application to GSM	ATQ0	DCE transmits result codes
GSM to application	OK	Command valid
Application to GSM	ATQ1	Result codes are suppressed and not transmitted
GSM to application	(none)	No response

V – DCE response format

Determines the DCE response format, with or without header characters <CR><LF>, and with the use of numeric result codes.

	V0	**V1**
Information responses	<text><CR><LF>	<CR><LF> <text><CR><LF>
Result codes	<numeric code><CR>	<CR><LF> <verbose code><CR><LF>
Application to GSM	ATV0	DCE transmits limited headers and trailers and numeric result codes
GSM to application	0	Command is valid (0 means OK)
Application to GSM	ATV1	DCE transmits full headers and trailers and verbose response text
GSM to application	OK	Command is valid

Z – Default configuration

Restores the configuration profile. Any call is released.

Application to GSM	ATZ	
GSM to application	OK	Command valid

&W – Save configuration

This commands writes the active configuration to a non-volatile memory (EEPROM).

Application to GSM	AT&W	Writes current configuration to EEPROM
GSM to application	OK	Command valid

E – Echo

This command is used to determines whether or not the modem echoes characters received by an external application (DTE).

Application to GSM	ATE0	Characters are not echoed
GSM to application	OK	Done
Application to GSM	ATE1	Characters are echoed
GSM to application	OK	Done

&F – Restore factory settings

This command is used to restore the factory settings from EEPROM.

Application to GSM	AT&F	Ask for restoring the factory settings
GSM to application	OK	Done
Application to GSM	AT&F0	Ask for restoring the factory settings
GSM to application	OK	Done

&V – Display configuration

This command is used to display modem configuration.

&V0:	Display the modem configuration in RAM.
&V1:	Display the modem configuration in EEPROM.
&V2:	Display the factory modem configuration.

The parameters which are displayed are the following:

Q, V, S0, S2, S3, S4, S5, +CR, +CRC, +CMEE, +CBST, +SPEAKER, +ECHO

Application to GSM	AT&V0	RAM modem parameters
GSM to application	Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008 +CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1 +SPEAKER:0 +ECHO:0 OK	Done

I – Request identification information

This command causes the GSM module to transmit one or more lines of specific information text.

I0: Display the manufacturer followed by model identifications. This command is equivalent to +CGMI and +CGMM.

I3: Display the revision identification (equivalent to +CGMR).

I4: Display the modem configuration in RAM (equivalent to &V0).

I5: Display the modem configuration in EEPROM (equivalent to &V1).

I6: Display the modem data features. This command enumerates the supported data rates, data modes, and fax classes.

I7: Display the modem voice features.

If the value is different, an ”OK” string will be sent back.

Application to GSM	ATI0	Manufacturer and model identifications
GSM to application	WAVECOM MODEM 900P OK	GSM 900 MHz primary band
Application to GSM	ATI3	Revision identification
GSM to application	310_G250.51 806216 032199 17:04 OK	Software release 3.10, revision 51 generated on the 21st of March 1999
Application to GSM	ATI6	Modem data features
GSM to application	DATA RATES: AUTOBAUD, 300, 1 200, 1 200/75, 2 400, 4 800, 9 600 DATA MODES: T/NT, ASYNCHRONOUS FAX CLASS 1 OK	Done
Application to GSM	ATI7	Modem voice features

Parameters definition

<da>	Destination Address, coded like GSM 03.40 TP-DA.
<dcs>	Data Coding Scheme, coded like in document [5].
<dt>	Discharge Time in string format: ”yy/MM/dd,hh:mm:ss±zz” (Year [00-99], Month [01–12], Day [01–31], Hour, Minute, Second and Time Zone [quarters of an hour]).
<fo>	First Octet, coded like SMS-SUBMIT first octet in document [4], default value is 17 for SMS-SUBMIT.
<index>	Place of storage in memory.
<length>	Text mode (+CMGF=1): number of characters PDU mode (+CMGF=0): length of the TP data unit in octets.
<mem1>	Memory used to list, read and delete messages. (+CMGL, +CMGR and +CMGD).
<mem2>	Memory used to write and send messages. (+CMGW, +CMSS).
<mid>	CBM Message Identifier.
<mr>	Message Reference.
<oa>	Originator Address.
<pid>	Protocol Identifier.
<pdu>	For SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format, coded as specified in doc [4] For CBS: GSM 03.41 TPDU in hexadecimal format.
<ra>	Recipient Address.
<sca>	Service Center Address.
<scts>	Service Center Time Stamp in string format: “yy/MM/dd,hh:mm:ss±zz”. (Year/Month/Day,Hour:Min:Seconds±TimeZone).
<sn>	CBM Serial Number.
<st>	Status of a SMS-STATUS-REPORT.
<stat>	status of message in memory.
<tooa>	Type-of-Address of <oa>.
<tora>	Type-of-Address of <ra>.
<tosca>	Type-of-Address of <sca>.
<total1>	Number of message locations in <mem1>.
<total2>	Number of messages locations in <mem2.
<used1>	Total number of messages locations in <mem1>.
<used2>	Total number of messages locations in <mem2.
<vp>	Validity Period of the short message, default value is 167.

+CSMS – Select message service

The supported services are GSM originated (SMS-MO) and terminated short message (SMS-MT), Cell Broadcast Message (SMS-CB) services.

The syntax is: AT+CSMS=<service>

<service>:

0: SMS AT commands are compatible with GSM 07.05 Phase 2 version 4.7.0.
1: SMS AT commands are compatible with GSM 07.05 Phase 2 + version .

Application to GSM	AT+CSMS=0	SMS AT command Phase 2 version 4.7.0
GSM to application	+CSMS: 1, 1, 1 OK	SMS-MO,SMS-MT and SMS-CB supported
Application to GSM	AT+CSMS=1 SMS	AT command Phase 2 +
GSM to application	+CMS ERROR: 301	SMS service Phase 2+ not supported
GSM to application	+CSMS: 0, 1, 1, 1 OK	GSM 03.40 et 03.41 (SMS AT command Phase 2 version 4.7.0), SMS-MO,SMS-MT and SMS-CB supported
Application to GSM	AT+CSMS=?	Possible service
GSM to application	+CSMS: (0) OK	Only GSM 03.40 et 03.41 is possible (SMS AT command Phase 2 version 4.7.0)

+CPMS – Preferred Message Storage

This command allows to define the message storage area to be used for reading, writing…

Command syntax: AT+CPMS=<mem1>, [<mem2>]

<mem1>: Memory used to list, read and delete messages. It can be:

- **"SM"**: SMS message storage (in SIM) (default)
- **"BM"**: CBM message storage (in volatile memory).

<mem2>: Memory used to write and send messages

- **"SM"**: SMS message storage (in SIM) (default).

If the command is correct, the following indication message is sent:

+CPMS: <used1>,<total1>,<used2>,<total2>

When <mem1> is selected, all following +CMGL, +CMGR and +CMGD commands are related to the type of SMS stored in this memory.

Application to GSM	AT+CPMS=?	Possible message storages
GSM to application	+CPMS: ((”SM”,”BM”), (”SM”)) OK	Read, list, delete: SMS or CBM. Write,send: SMS
Application to GSM	AT+CPMS?	Read it
GSM to application	+CPMS: ”SM”, 3, 10,”SM”,3,10 OK	Read, write…SMS from/to SIM 3 SMS are stored in SIM. 10 is the total available SIM memory.
Application to GSM	AT+CPMS=”AM”	Select false message storage
GSM to application	+CMS ERROR: 302	
Application to GSM	AT+CPMS=”BM”	Select CBM message storage
GSM to application	+CPMS: 2, 20,3,10 OK	Read, list,delete CBM from RAM. 2 CBM are stored in RAM
Application to GSM	AT+CPMS?	Read it
GSM to application	+CPMS: ”BM”, 2, 20, ”SM”,3,10 OK	Read, list,delete CBM from RAM. Write SMS to SIM.

+CMGF – Preferred Message Format

The formats implemented are the text mode and the PDU mode.

In PDU mode, a complete SMS Message including all header information is passed as a binary string (in hexadecimal format, so only this set of characters is allowed: {‘0’,’1’,’2’,’3’,’4’,’5’,’6’,’7’,’8’,’9’, ‘A’, ‘B’,’C’,’D’,’E’,’F’}).
Each pair or characters is converted to a byte (ex: ‘41’ is converted to the ASCII character ‘A’, which ASCII code is 0x41 or 65).

In Text mode, every commands and responses are in ASCII characters.
The chosen format is stored in EEPROM by the command +CSAS.

Application to GSM	AT+CMGF?	Current message format
GSM to application	+CMGF: 1 OK	Text mode
Application to GSM	AT+CMGF=?	Possible message format
GSM to application	+CMGF: (0-1) OK	Text or PDU modes are available

Example to send a SMS Message in PDU mode:

Application to GSM	AT+CMGF=0	PDU message format
GSM to application	OK	PDU mode valid
Application to GSM	AT+CMGS=14<CR> 0001030691214365000004 C9E9340B	Send complete MSG in PDU mode, no SC address
GSM to application	+CMGS: 4	MSG correctly sent, <mr>
OK		is returned

The message <pdu> is composed of the SC address («00 means no SC address given, use default SC address read with +CSCA command) and the TPDU message.

The length of **octets** of the TPDU buffer is 14, coded as GSM 03.40

In this case the TPDU is: 0x01 0x03 0x06 0x91 0x21 0x43 0x65 0x00 0x00 0x04 0xC9 0xE9 0x34 0x0B, which means regarding GSM 03.40:

<fo>:	0x01 (SMS-SUBMIT, no validity period)
<mr> (TP-MR):	0x03 (Message Reference)
<da> (TP-DA):	0x06 0x91 0x21 0x43 0x65 (destination address +123456)
<pid> (TP-PID):	0x00 (Protocol Identifier)
<dcs> (TP-DCS):	0x00 (Data Coding Scheme: 7 bits alphabet)
<length> (TP-UDL):	0x04 (User Data Length, 4 characters of text)
TP-UD:	0xC9 0xE9 0x34 0x0B (User Data: ISSY)

TPDU in hexadecimal format must be converted into two ASCII characters, e.g. octet with hexadecimal value 0x2A is presented to the mobile as two characters '2' (ASCII 50) and 'A' (ASCII 65).

+CSAS – Save Settings

All settings specified in command +CSCA and +CSMP are stored in EEPROM if the SIM card is a phase 1 card or in the SIM card if it is phase 2.

Application to GSM	AT+CSAS	Store +CSCA and +CSMP parameters
GSM to application	OK	Parameters are saved

+CRES – Restore settings

All settings specified in command +CSCA and +CSMP are restored from EEPROM if the SIM card is phase 1 or from the SIM card if it is a phase 2 SIM card.

Application to GSM	AT+CRES	Restore +CSCA and +CSMP parameters
GSM to application	OK	Parameters are restored

+CSDH – Show text mode parameters

This commands gives more informations in text mode result codes. These informations are in brackets in commands +CMTI, +CMT, +CDS, +CMGR, +CMGL.

Application to GSM	AT+CSDH?	Current value
GSM to application	+CSDH: 0 OK	Do not show header values

+CNMI – New message indication

This command selects the procedure how receiving the message from the network.
The application must send the following command:

Command syntax: AT+CNMI=**<mode>,<mt>,<bm>,<ds>,<bfr>**

<mode>: controls the processing of unsolicited result codes

Only <mode>=2 is supported.

Any other value for **<mode>** (0,1 or 3) is accepted (return code will be OK), but the processing of unsolicited result codes will be the same than for <mode>=2.

0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved. Otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the TA when TA-TE link is reserved and flush them to the TE after reservation. Otherwise forward them directly to the TE
3	Forward unsolicited result codes directly to the TE. TA-TE link specific in band used to embed result codes and data when TA is in on-line data mode.

<mt>: sets the result code indication routing for SMS-DELIVERs. Default is 0.

0	No SMS-DELIVER indications are routed.
1	SMS-DELIVERs are routed using unsolicited code: +CMTI: « SM », <index>
2	SMS-DELIVERs (except class 2 messages) are routed using unsolicited code: +CMT: [<alpha>,] <length> <CR> <LF> <pdu> (PDU mode) or +CMT: <oa>,[<alpha>,] <scts> [,<tooa>, <fo>, <pid>, <dcs>, <sca>,<tosca>, <length>] <CR><LF><data> (text mode)
3	Class 3 SMS-DELIVERS are routed directly using code in <mt>=2 ; Message of other classes result in indication <mt>=1

<bm>: set the rules for storing received CBMs (Cell Broadcast Message) types depend on its coding scheme, the setting of Select CBM Types (+CSCB command) and <bm>. Default is 0.

0	No CBM indications are routed to the TE. The CBMs are stored.
1	The CBM is stored and an indication of the memory location is routed to the customer application using unsolicited result code: +CBMI: ”BM”, <index>
2	New CBMs are routed directly to the TE using unsolicited result code. +CBM: <length><CR><LF><pdu> (PDU mode) or +CBM:<sn>,<mid>, <dcs>,<page>,<pages> (Text mode) <CR><LF> <data>
3	Class 3 CBMs: as <bm>=2. Other classes CBMs: as <bm>=1.

<ds> for SMS-STATUS-REPORTs. Default is 0.

0	No SMS-STATUS-REPORTs are routed.
1	SMS-STATUS-REPORTs are routed using unsolicited code: +CDS: <length> <CR> <LF> <pdu> (PDU mode) or +CDS: <fo>,<mr>, [<ra>] , [<tora>], <scts>,<dt>,<st> (Text mode)

<bfr> Default is 0.

0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)
1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.

Application to GSM	AT+CNMI=2,1,0,0,0	<mt>=1
GSM to application	OK	
GSM to application	+CMTI: ”SM”, 1	Message received
Application to GSM	AT+CNMI=2,2,0,0,0 <mt>=2	
GSM to application	OK	
GSM to application	+CMT:”123456”, ”98/10/01,12:30:00+00”, 129, 4, 32, 240, ”15379”, 129,5<CR><LF> Received Message	Message received
Application to GSM	AT+CNMI=2,0,0,1,0 <ds>=1	
GSM to application	OK	
Application to GSM	AT+CMGS=”+33146290800”<CR> Message to send <ctrl-Z>	Send a message in text mode

GSM to application	+CMGS: 7 OK	Successful transmission
GSM to application	+CDS: 2, 116, ”+33146290800”, 145, ”98/10/01,12:30:07+04”, ”98/10/01 12:30:08+04”, 0	Message was delivered correctly

+CMGR – Read message

This command allows the application to read stored messages.

Command syntax: AT+CMGR=<index>

Response syntax for text mode:

+CMGR:<stat>,<oa>,[<alpha>,] <scts> [,<tooa>,<fo>, <pid>,<dcs>,<sca>,<tosca>,<length>] <CR><LF> <data>
(for **SMS-DELIVER** only)

+CMGR:<stat>,<da>,[<alpha>,] [,<toda>,<fo>,<pid>,<dcs>, [<vp>], <sca>, <tosca>,<length>]<CR><LF> <data>
(for **SMS-SUBMIT** only)

Response syntax for PDU mode:

+CMGR: <stat>, [<alpha>] ,<length> <CR><LF> <pdu>

A message read with status ”REC UNREAD” will be updated in memory with the status ”REC READ” because it has been read.

Example:

GSM to application	+CMTI: ”SM”,1	New message received
Application to GSM	AT+CMGR=1	Read the message
GSM to application	+CMGR: ”REC UNREAD”, ”0146290800”,”98/10/01,18:22:11+00” , <CR><LF> ABCdefGHI OK	
Application to GSM again	AT+CMGR=1	Read the message
GSM to application	+CMGR: ”REC READ”, ”0146290800”,”98/10/01,18:22:11+00”, <CR><LF> ABCdefGHI OK	Message is read now
Application to GSM	AT+CMGR=2	Read a bad index
GSM to application	+CMS ERROR: 321	Error: invalid index
Application to GSM	AT+CMGF=0 ;+CMGR=1	in PDU mode
GSM to application	+CMGR: 2,,<length> <CR><LF> <pdu> OK	Message is stored but unsent, No <alpha> field

+CMGL – List message

This command allows the application to read stored messages, by indicating the type of the message to read.

Command syntax: AT+CMGL=<stat>

Response syntax for text mode:

+CMGL: <index>,<stat>,<da/oa>[,<alpha>], [<scts>, <tooa/toda>, <length>] <CR><LF><data> (for **SMS-DELIVER** and **SMS-SUBMIT**, may be followed by other <CR><LF>+CMGL:<index>…)

Response syntax for PDU mode:

+CMGL: <index>,<stat>, [<alpha>], <length> <CR><LF> <pdu> (for **SMS-DELIVER** and **SMS-SUBMIT**, may be followed by other <CR><LF>+CMGL:<index>…)

<stat> possible values (status of message in memory):

PDU mode	**Text mode**	
0	”REC UNREAD” (received unread message)	
1	”REC READ” (received read message)	
2	”STO UNSENT” (stored unsent message)	
3	”STO SENT” (stored sent message)	
4	”ALL” (all messages)	
Application to GSM	AT+CMGL=”REC UNREAD”	List unread messages in text mode
GSM to application	+CMGL: 1, ”REC UNREAD”, ”0146290800”, <CR><LF> Unread Message! +CMGL: 3, ”REC UNREAD”, ”46290800”, <CR><LF> Another Unread Message! OK	2 messages are unread, these messages will then have their status changed to ”REC READ”. (+CSDH: 0)
Application to GSM	AT+CMGL=”REC READ”	List read messages in text mode
GSM to application	+CMGL: 2, ”REC READ”, ”0146290800”, <CR><LF> Keep cool OK	
Application to GSM	AT+CMGL=”STO SENT”	Read stored and sent messages
GSM to application	+CMS ERROR: 322	No message found

+CMGS – Send message

Command syntax in text mode:

AT+CMGS= <da> [,<toda>] <CR>

text is entered <ctrl-Z / ESC >

Command syntax in PDU mode:

AT+CMGS= <length> <CR>

PDU is entered <ctrl-Z / ESC >

The <address> field is the address of the terminal network to whom the message is sent. To send the message, simply type <ctrl-Z> character (ASCII 26). The text can contain all existing characters except <ctrl-Z> and <ESC> (ASCII 27).
This command is abortable using the <ESC> character when entering text.
In PDU mode, only hexadecimal characters are used ('0'...'9','A'...'F').

Example of use:

Application to GSM	AT+CMGS="+33146290800"<CR> Please Call me soon, Fred.<ctrl-Z>	Send a message in text mode
GSM to application	+CMGS: <mr> OK	Successful transmission
Application to GSM	AT+CMGS=<length><CR> <pdu><ctrl-Z>	Send a message in PDU mode
GSM to application	+CMGS: <mr> OK	Successful transmission

The message reference <mr> which is returned back to the application is allocated by the GSM module. This number begins with 0 and is incremented by one for each outgoing message (successful and failure case) ; it is cyclic on one byte (0 follows 255).

Note: this number is not a storage number - outgoing messages are not stored.

+CMGW – Write Message to Memory

This command stores a message to memory storage (either SMS-SUBMIT or SMS-DELIVERS). The memory location <index> is returned (no choice possible as with phonebooks +CPBW).

The entering of text or PDU is done similarly as specified in command Send Message +CMGS.

Command syntax in text mode: (<index> is returned in both cases)

AT+CMGW= <oa/da> [,<tooa/toda> [,<stat>]] <CR>
enter text <ctrl-Z / ESC>

Command syntax in PDU mode:

AT+CMGW= <length> [,<stat>] <CR>
give PDU <ctrl-Z / ESC>

Response syntax: +CMGW: <index>
or +CMS ERROR: <err> if writing fails

Parameter Definition:

<oa/da>: Originating or Destination Address Value in string format.

<tooa/toda>: Type of Originating / Destination Address.

<stat>: Integer type in PDU mode (default 2 for +CMGW), or string type in text mode (default ”STO UNSENT” for +CMGW). It indicates the status of message in memory. If <stat> is omitted , the stored message is considered like a message to be send.

Defined <stat> values:

PDU mode	**Text mode**
0	”REC UNREAD”
1	”REC READ”
2	”STO UNSENT”
3	”STO SENT”

<length>: The length of the actual data unit in octets

Example:

Application to GSM	AT+CMGW=”+33146290800”<CR> Hello, how are you?<ctrl-Z>	Write a message in text mode
GSM to application	+CMGW: 4 OK	Message stored in index 4
Application to GSM	AT+CMGW=<length><CR> <pdu><ctrl-Z>	Write a message in PDU mode
GSM to application	+CMGW: <index> OK	Message stored in <index>

+CMSS – Send Message From Storage

This command sends message with location value <index> from storage to the network.

Command syntax: AT+CMSS=<index>[,<da> [,<toda>]]

Response syntax: +CMSS: <mr>
or +CMS ERROR: <err> if sending fails

If new recipient address <da> is given, it will be used instead of the one stored with the message.

Example of use in Text Mode:

Application to GSM	AT+CMGW=0660123456<CR> Today is my birthday<ctrl-Z>	Write a message in text mode
GSM to application	+CMGW: 5 OK	Message stored in index 5
Application to GSM	AT+CMSS=5	Send the message 5
GSM to application	+CMSS: <mr> OK	Successful Transmission
Application to GSM	AT+CMSS=5, 0680654321	Send the message 5 to a different GSM
GSM to application	+CMSS: <mr> OK	Successful Transmission

+CSMP – Set Text Mode Parameters

This command shall be used to select value for the <vp>, <pid>, the <dcs>.
The application must send the following command:

Command syntax: AT+CSMP=<fo>, <vp>, <pid>,<dcs>

<fo> byte is composed of 6 different fields:

b7	**b6**	**b5**	**b4**	**b3**	**b2**	**b1**	**b0**
RP	UDHI	SRR	VPF	VPF	RD	MTI	MTI

RP: Reply Path, not used in text mode.

UDHI: User Data Header Information, b6=1 if the beginning of the User Data field contains a Header in addition to the short message. This option is not supported in +CSMP command, but can be used in PDU mode (+CMGS).

SRR: Status Report Request, b5=1 if a status report is requested. This mode is supported.

VPF: Validity Period Format

b4=0 & b3=0 -> <vp> field is not present

b4=1 & b3=0 -> <vp> field is present in relative format

Others formats (absolute & enhanced) are not supported.

RD: Reject Duplicates, b2=1 to instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC which has the same <mr> and the same <da> as the previously submitted

SM from the same <oa>.

MTI: Message Type Indicator

b1=0 & b0=0 -> SMS-DELIVER (in the direction SC to MS)

b1=0 & b0=1 -> SMS-SUBMIT (in the direction MS to SC)

In text mode <vp> is only coded in ”relative” format. The default value is 167 (24 hours). This means that one octet can describe different values:

VP value	Validity period value
0 to 143	(VP + 1) x 5 minutes (up to 12 hours)
144 to 167	12 hours + ((VP - 143) x 30 minutes)
168 to 196	(VP - 166) x 1 day
197 to 255	(VP - 192) x 1 week

<pid> is used to indicate the higher layer protocol being used or indicates interworking with a certain type of telematic device. For example, 0x22 is for group 3 telefax, 0x24 is for voice telephone, 0x25 is for ERMES.

<dcs> is used to determine the way the information is encoded. UCS2 alphabet and compressed text are not supported. Only GSM default alphabet and 8 bit data are supported.

Application to GSM	AT+CSMP?	Current values
GSM to application	+CSMP: 0,0,0,0 OK	No validity period <dcs>= PCCP437 alphabet (8 bits -> 7 bits)
Application to GSM	AT+CSMP=17,23,64,244	<vp> = 23 (2 hours, relative format) <dcs> = GSM 8 bits alphabet
GSM to application	OK	Command correct

+CMGD – Delete message

This command shall be used after a read-command in order to delete the any stored message.

For example:

GSM to application	+CMTI: ”SM”,3	New message received
Application to GSM	AT+CMGR=3 Read it	
GSM to application	+CMGR: ”REC UNREAD”, ”0146290800”,,”98/10/01, 18:19:20+0 0” <CR><LF> Received Message! OK	Unread message received from 0146290800 on the 01/10/1998 at 18H 19m 20s
Application to GSM	AT+CMGD=3	Delete it
GSM to application	OK	Message deleted

+CSCA – Service center address

This command shall be used to indicate to which service center the message has to be sent.
The GSM module has no default value for this address. If the application tries to send a message without having indicated the service centre address, an error will be generated. So, the application has to indicate this address at initialization. This address is then valid all the time. The application may change it if needed.

Application to GSM	AT+CMGS=”+33146290800”<CR> Hello, how are you?<ctrl-Z>	Send a message
GSM to Application	+CMS ERROR: 330	Service centre unknown
Application to GSM	AT+CSCA=”0696741234”	Service centre initialisation
GSM to application	OK	
Application to GSM	AT+CMGS=”+33146290800” <CR> Happy Birthday!<ctrl-Z>	Send the same message again
GSM to application	+CMGS: 1 OK	Successful transmission

+CSCB – Select Cell Broadcast Message

Command syntax: AT+CSCB= <mode>, [<mids>, [<dcss>]]

Set command selects which types of CBMs are to be received by the ME, This command is allowed in both PDU and text modes.

The <bm> parameter of +CNMI command controls the message indication.

Test read command (AT+CSCB?) is not supported.

The activation of CBM reception (<mode>=0) can select only specific Message Identifiers (list in <mids>) for specific Languages (list in <dcss>), but the deactivation stops any reception of CBMs (only AT+CSCB=1 is allowed)

Message Identifiers (<mids> parameter) indicates which type of message identifiers the ME should listen to.

Supported languages (<dcss> parameter) are: 0 for German, 1 for English, 2 for Italian, 3 for French, 4 for Spanish, 5 for Dutch, 6 for Swedish, 7 for Danish, 8 for Portuguese, 9 for Finnish, 10 for Norwegian, 11 for Greek, 12 for Turkish, 13 for Hungarian, 14 for Polish and 32 for Czech.

Application to GSM	AT+CSCB=0,”15-17,50,86”, ””	Accept SMS-CB types 15,16,17,50 and 86 in any language
GSM to Application	OK	CBMs can be received
Application to GSM	+CBM: 10<CR><LF> 00112233445566778899	CBM length of a received Cell Broadcast message (SMS-CB), CBM bytes in PDU mode

GSM to application	AT+CSCB=1	Deactivate the reception of CBMs
Application to GSM	OK	CBM reception is completely stopped

+WCBM – Cell Broadcast Message Identifiers

Command syntax: AT+WCBM= <mode> [, <mids>, <dcss>]

This specific command is used to read the SIM file EF-CBMI.

This file is not used with +CSCB command, the application should read this file (AT+WCBM?) and combine the Message Identifiers with those required for the application.

Application to GSM	AT+WCBM=”10,100, 1000,10000”	Write 4 message identifiers in EF-CBMI
GSM to Application	OK	CBMIs are stored if EF-CBMI
Application to GSM	AT+WCBM?	Read the CBMIs in EF-CBMI
GSM to application	+WCBM=”10,100,1000,10000”	4 CBMIs are stored if EF-CBMI

+WMSC – Message status modification

Command syntax: AT+WMSC= <loc>, <status>

<loc>	location number of the stored message (integer)
<status>	new status to be stored, as for +CMGL command

Possible responses:

OK	if the location is valid
+CME ERROR: 22	if <loc> is invalid or free
+CME ERROR: 3	if the new <status> and the previous one are incompatible (1)

Note 1: The accepted status changes are from READ to NOT READ and vice versa, and from SENT to NOT SENT and vice versa.

If all the parameters are correct, the module overwrites the whole SMS in the SIM. Only the first byte (Status byte) is changed.

+WMGO – Message overwriting

The +CMGW writes a SMS to the first free location. To write a SMS to a specified location, the +WMGO specific command forces the module to write a SMS (with +CMGW command) to the location specified with +WMGO, but just for one +CMGW command.

Command syntax: AT+WMGO= <loc>

<loc> location number of the SIM record to write or overwrite

Possible responses:

OK	if <loc> is a valid SMS location, for AT+WMGO=? and for AT+WMGO?
+CME ERROR: 21	if <loc> is out of the SIM capacity range.
+WMGO: <loc>	for AT+WMGO?

Then on the next AT+CMGW command, the used record number will be that one specified by AT+WMGO command. The location is then forgotten, and to make a second over writing, the +WMGO shall be used again.

If the external application specifies a free location, and if an incoming message is received before the AT+CMGW command, the module may store the incoming message in a free location, which could be unfortunately the one specified by +WMGO (the module does not prevent this case). Then if the user issues a AT+CMGW command, without changing the AT+WMGO location, the new message will be overwritten!

Be aware that this location number is not kept over a software reset.

A complete manual with all AT-commands is available at our web site as a PDF-file (www.westermo.se)

6.0 LED Function

• LED Off	Device switch off – Not ready
• LED On	Device switched on – Connecting to network
• LED flashing slowly	Device switched on – Idle mode
• LED flashing rapidly	Device switched on – Transmission mode

7.0 Application examples

The AT-commands are used to configure the modems. The AT-commands can be sent from a terminal or a PC with a terminal program (Hyperterminal, Procomm etc.) Make sure the number of data bits is the same in both the modem and the terminal. Factory default in GS-01 is 8,N,1 and the data rate is set to automatic baud rate detection.

These tests have been made with PC to modem cables, fully wired.
The modems/adapters have been factory default before any commands have been sent.

To restore factory settings type AT&F followed by AT&W.

To be able to get to the command mode when the modem is online, type +++ (no Enter) and wait. An OK will appear on the screen.
Type ATH to hang up. Type ATO to go online.
The connection can be shut down from both sides.
Hint! Always check the Signal Quality with AT+CSQ before dialling (See 8.3 b).

7.1 GS-01 to GS-01

Data between GS-01 and GS-01 with V.32 protocol

GS-01 in the dialling end

AT+CPIN=xxxx	Insert PIN number if required
AT+CBST=7,0,1	Bearer type selection. Choose data rate and protocol. (9 600, V.32)
ATDxxxxxxxxxx	Dial the number

GS-01 in the receiving end

AT+CPIN=xxxx	Insert PIN number if required before expected call
AT+CBST=7,0,1	Bearer type selection. Choose data rate and protocol. (9 600, V.32)
ATS0=1 or	Automatic answering after 1 ring signal
ATA	Answer a call
AT&W	Store active configuration

7.2 GS-01 to GS-01 with V.110 protocol for faster connection.

Same as above but replace AT+CBST=7,0,1 to:

AT+CBST=71,0,1	Bearer type selection, choose data rate and protocol. (9 600, V.110)
AT&W	Store active configuration

7.3 GS-01 to TD-32 (Analogue)

Data between GS-01 and TD-32 with GS-01 in the dialing end.
GS-01 in the dialling end

AT+CPIN=xxxx	Insert PIN number if required
AT+CBST=7,0,1	Bearer type selection. Choose data rate and protocol. (9 600, V.32)
ATDxxxxxxxxxx	Dial the number
AT&W	Store active configuration

TD-32 in the receiving end.
Factory default settings except for SW4.
It was set for 9 600,8,N,1 i.e. 2,3,5 and 6 ON.
TD-32 answers automatically after 2 ring signals

7.4 GS-01 to ISDN (ID-90)

The necessary settings to send data between GS-01 and ID-90 (ISDN terminal adapter).

Data between GS-01 and ID-90 (ISDN terminal adapter)
GS-01 in the dialling end

AT+CPIN=xxxx	Insert PIN number if required
AT+CBST=71,0,1	Bearer type selection. Choose data rate and protocol. (9 600, V.110)
ATDxxxxxxxxxx	Dial the number
AT&W	Store active configuration

ID-90 in the receiving end

AT&F0	
AT&F1	Factory default
ATB0	Sets the B channel protocol to V.110 asynchronous
ATN4	Sets line baudrate for B channel protocol V.110 to 9 600 bit/s
AT**V110LLC=1	Sets low layer compatibility to pass detailed information about the V.110 protocol to the called party.
AT%B4	Sets local baudrate to 9 600 bit/s
AT&W	Store active configuration

Generally, the MSN number is given by the network provider (e.g. Telia) including the area code.
E.g. area code = 016 and subscriber number 480 130 the MSN should be programmed as AT**MSN=016480130.
If your ISDN-Controller is connected to the internal S0 bus of a PBX, use the MSN of the respective extension. For more information, please refer to your PBX supplier manual.

7.5 GS-01 to GS-01 with Short Message Service SMS

GS-01 in the sending end

AT+CPIN=xxxx	Insert PIN number if required
AT+CMGS=”0709999999”<CR> > Hello darling.<ctrl-Z>	After the AT command, type the number to dial followed by Enter. Do not forget the “ “. The cursor will jump to the next line and a > will appear. Type your message followed by ctrl Z.
+CMGS: no OK	no is the number of SMS that have been sent.

The same procedure is done when a message is sent to a GSM cellular phone.

GS-01 in the receiving end

+CMTI: “SM”,n	Indicates that a message have been received and can be read at location n.
AT+CMGR=n	To read what is stored at location n.
+CMGR: ”REC UNREAD”, ”+46708888888”,,”00/09/21, 08:38:35-04”	Message from GS-01.
Hello darling.	Message from sender.

7.6 GS-01, Dial up when DTR is activated

AT+CPIN=xxxx	Insert PIN number if required
AT+CPBS=”SM”	Select ADN phonebook memory storage
AT+CPBW=1,”xx”,129	Storage of number to call in the first location in the current phonebook memory storage. “xx”= number to call.
AT%D1	Activates automatic dialling of the phone number stored in the first location of ADN phonebook when DTR goes from OFF to ON.
AT&W	Store active configuration.

It is not possible to send SMS-message with above application.

8.0 Trouble Shooting

8.1 The modem does not answer through the serial link

a) Is the modem correctly powered on? (see table under section “Connections”)

b) Is the serial cable suitable and adjusted in both ends
(see table under section “Connections”)

c) Check that the communication program is properly configured:

- Data Bits: 8
- Parity: None
- Stop bit: 1
- Data rate: 2 400, 4 800 or 9 600 bit/s

d) Does any program interfere with your communication program
(conflict on communication port access)

8.2 The modem always return “Error” when trying to issue a communication

a) Issue **AT+CMEE=1** to have extended error cause retry

Cause value	Diagnostic	Hint
0	Phone failure	Contact Westermo
3	Operation not allowed	
4	Operation not supported	
10	SIM not inserted	Insert the SIM card and check that it is properly mounted
11	SIM PIN required	Enter PIN code
12	SIM PUK required	Enter PUK code
13	SIM Failure	Check validity of your SIM card.
16	Incorrect password	Check the code you entered
17	SIM PIN2 required	Enter PIN2 code
18	SIM PUK2 required	Enter PUK2 code
26	Dial string too long	Check your phone number (max 20 digits)
30	No network service	

8.3 The modems always return "No carrier" when trying to issue a communication

a) After s failed attempt (no carrier"), issue **AT+CEER** to have extended error cause

Cause value	Diagnostic	Hint
1	Unallocated phone number	
16	Normal call clearing	
17	User busy	
18	No user responding	
19	User alerting, no answer	
20	Call rejected	
21	Number changed	
31	Normal, unspecified	
50	Requested facility not subscribed	Check your subscription (data subscription available)
68	ACM => ACM max	Credit of your pre-paid SIM card expired
252	Call baring on outgoing calls	
253	Call baring on incoming calls	
3,6,8,29,34, 38,41,42,43, 44,47,49,57, 58,63,65,69 70,79,254	See AT command manual for further details or call network provider	

b) Is the received signal strong enough?

Use **AT+CSQ** commands to check that the signal is strong enough to establish a connection.

- 1–10 Could be insufficient
- 11–33 Should be sufficient
- 99 Insufficient

c) Insure the selected bearer type is supported by the called party.

d) Then, insure the selected bearer type is supported by the network.

e) If no success, try bearer selection type: AT+CBST=0,0,3

f) Use the AT-command **AT+GCAP** to insure the SIM card is available for data/fax calls. This command gives the complete capabilities list.

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